CLAIM AMENDMENTS

The current claim status is:

Claim 1. (currently amended) A system for batch processing ~~providing~~ a plurality of different combinatorial catalyst materials for evaluation comprising:

a physical vapor deposition apparatus including a sealable deposition chamber having a load lock chamber for receiving sample assemblies to be processed ~~an access means~~, the deposition chamber including a plurality of separately controllable plasma sources radially disposed about a central location within the deposition chamber such that the plasma directed from the sources may be focused upon the central location and ~~at least one~~ a substrate disposed upon a shaft vertically positioned at the central location of the deposition chamber around which shaft the substrate may axially rotate, the substrate having a plurality of discrete separated ~~areas thereon~~ sample assembly areas to which the plasma may be directed, ~~at least one~~ each of the plurality of separately controllable plasma sources comprising a cluster of ~~more than one~~ plasma guns each gun connected to a certain deposition material type to be deposited and oriented with respect to the central location such that each gun in the cluster may be focused upon a selected sample assembly in ~~toward~~ the central location wherein the deposition of plasma of a predetermined type and in a predetermined amount upon each selected sample assembly by each plasma gun is individually controlled by varying an amount of power and an amount of time of deposition for the type of material on a selected area for each gun;

the ~~at least one~~ substrate being controllably positionable within the deposition chamber such that a first sample assembly ~~selected area~~ upon the substrate may be positioned in accordance with a selection from a matrix of ~~x~~ z, ~~y~~ x and y ~~z~~ coordinates that define the location of the sample assembly, wherein, z defines axial rotation coordinates that align the sample assembly on the substrate with one of the plasma gun clusters, x defines vertical coordinates that align the same sample assembly with the same one of the plasma gun clusters and y defines horizontal coordinates that align the same sample assembly with the same one of the plasma gun clusters, each such alignment occurring when the plasma gun clusters are sequentially focused upon each sample assembly as the substrate rotates to a fixed radial position around the central axis ~~in an alignment with respect to the focus of each of the plurality of separately controllable plasma sources~~;

~~a means for~~ controlling the power, time and material type of the plasma deposition from each sources ~~for each selected area when the plasma source~~ and the substrate are ~~such that each selected area upon the substrate may be~~ sequentially aligned according to the z, x, y

coordinates of the matrix~~with respect to each plasma source according to predetermined parameters that determine the exposure of the area to one or more than one of the controllable plasma sources~~.

Claim 2. (currently amended) The system of claim 1 in which ~~the means for~~ controlling the plasma sources comprises inputting ~~programmable~~ parameters determin~~ed~~ing for the selected area~~a specified flux of plasma~~, the parameters comprising the amount of power, ~~and~~ the amount of time, and the characteristics of the material type to be deposited by the plasma source upon the selected area of the substrate.

Claim 3. (currently amended) The system of claim 1 in which ~~the means for~~ controlling the plasma sources comprises ~~programmable parameters determining for aspecified flux of plasma~~, controlling the amount of power, ~~and~~ the amount of time~~,~~ and the ~~characteristics of the~~ type of material to be deposited by the plasma source upon the selected area of the substrate such that the area comprises multiple layers of materials.

Claim 4. (cancelled)

Claim 5. (cancelled)

Claim 6. (currently amended) The system of claim ~~3~~1 in which the substrate includes multiple separately defined circular areas and is centrally positioned within the chamber, the substrate being moveable with respect to a program controlled x-y table such that each separately defined circular area upon the surface of the substrate may be positioned by control means for the x-y table in ~~essential~~ alignment with the focus of ~~one or more than one~~ a plasma source.

Claim 7. (cancelled)

Claim 8. (currently amended) The system of claim 6 in which the multiple separately defined selected circular areas of the substrate are ~~comprise a plurality of separately defined areas~~ arranged in the a matrix defined by columns and rows.

Claim 9. (currently amended) The system of claim 8 in which ~~the relationship of the~~a number ($_N$) of separately defined circular areas in the rows ~~to~~ and a~~the~~ number of separately defined circular areas ($_N$) in the columns is rows$_N$ = columns$_N$.

Claim 10. (currently amended) The system of claim ~~9~~8 in which ~~the~~ a relationship ~~of the~~ a number ($_N$) of separately defined circular areas in one column to the number of separately defined circular areas in an adjacent column is areas in column$_N$ = N and areas in adjacent column $_{N+1}$ = N+1.

Claim 11. (currently amended) The system of claim 8 in which ~~the~~ a relationship of ~~the~~ a number of separately defined circular areas in one row to the number of separately defined areas in an adjacent row is : areas in row $_N$ = N and areas in adjacent row $_{N-1}$ = N-1.

Claim 12. (currently amended) The system of claim 1 in which the plasma sources are controlled such that the materials originating from the sources are deposited upon ~~an~~ selected area of the substrate in ~~at least one~~ either of 1) a sequential layer deposition and 2) a co-deposition.

Claim 13. (currently amended) The system of claim 8 wherein the substrate comprises a side surface of a block positioned within the central location of the chamber, the block having a multiplicity of cylindrical substrate elements extending from the side surface thereof, each cylindrical substrate element individually defining a selected area, the cylindrical substrate elements maintained in an array of ~~cylindrical~~ columns and ~~cylindrical~~ rows formed within the block, in which ~~the~~ upper surfaces of the cylindrical substrate elements comprise the discrete areas exposed to the sources.

Claim 14. (currently amended) The system of claim 13 in which the cylindrical substrate elements are inset within the block in a~~the~~ matrix and a plate having a plate matrix of openings concentric with the matrix of elements in the block is applied facing the surface of the block, such that the openings in the plate are aligned with the elements and ~~the~~ a cross-section area of an opening in the plate is less than ~~the~~ a cross-section area of the surface of the corresponding concentric cylindrical element.

Claim 15. (currently amended) The system of claim 16 in which ~~the means for~~ controlling ~~the sources of different ions~~ each plasma source includes selecting ~~means for selecting~~ one or more than one of at least: 1) an ion emitted by eacha plasma source within a cluster; 2) the amount of power and the duration of operation ~~of~~ for the source; and 3) the position of the substrate, such that thea selected area of the substrate is exposed to the plasma source at the selected power and at the selected ~~for the~~ duration ~~of operation determined~~.

Claim 16. (currently amended) The system of claim 15 in which ~~the means for~~ selecting a plasma sources and ~~the means for~~ controlling the amount of power and the duration of operation of the source includes ~~means for~~ controlling the sources in ~~essentially~~ the same operation such that plasma materials from the sources are co-deposited with respect to ~~an~~the selected area on the surface of the substrate.

Claim 17. (currently amended) The system of claim 15 in which ~~the means for~~ selecting a plasma sources and ~~the means for~~ controlling the amount of power and the duration of operation of the sources includes ~~means for~~ controlling the sources in ~~essentially~~ the same operation such that plasma materials from the sources are deposited as layers with respect to ~~an~~the selected area on the surface of the substrate.

Claim 18. (currently amended) The system of claim 15~~3~~ in which ~~the means for~~ controlling ~~the sources of different~~ ions includes ~~programmed means for~~ selecting one or more than one of at least: 1) onea plasma source within a cluster; 2) the amount of power and the duration of operation of the source; and 3) the position of the substrate, such that thea selected area of the substrate is exposed to the selected plasma source at the selected power and at the selected ~~for the~~ duration ~~of operation determined~~.

Claim 19. (currently amended) The system of claim 18 in which ~~the means for~~ selecting ~~a~~the plasma source and ~~the means for~~ controlling the amount of power and the duration of operation of the source includes ~~means for~~ controlling the sources in essentially the same operation such that plasma materials from the sources are co-deposited with respect to the selected~~an~~ area on the surface of the substrate.

Claim 20. (currently amended) The system of claim 18 in which ~~the means for~~ selecting thea plasma source and ~~the means for~~ controlling the amount of power and the duration of

operation of the source includes ~~means for~~ controlling the sources in essentially the same operation such that plasma materials from the sources are deposited as layers with respect to the selected~~an~~ area on the surface of the substrate.